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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,137	10/30/2003	Wendy Ng	A5701D1/T41510	3462

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Patent Counsel, M/S 2061
APPLIED MATERIALS, INC.
Legal Affairs Department
P.O. Box 450A
Santa Clara, CA 95052

EXAMINER	
KACKAR, RAM N	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/699,137	NG ET AL.	
	Examiner	Art Unit	
	Ram N Kackar	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6,8-12 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6,8-12and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 6, 8-10, 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nonaka (JP 5-326457-A) in view of Moran (US Patent No. 5,986,747).

Nonaka teaches a processing chamber (Fig. 1) for a plasma-based semiconductor fabrication process and a method of using the same employing an endpoint detection device arranged in an exhaust line of the processing chamber, the method comprising:

Providing a *processing chamber* 1 configured to receive plasma species from a plasma source, the processing chamber including a *throttle valve* 6 configured to output an exhaust from the processing chamber;

Providing a *bypass foreline* 7 positioned downstream from the throttle valve 6; and

Providing an *endpoint detection cell* 8 (abstract).

Nonaka fails to teach the bypass foreline including an *isolation valve* such that the endpoint detection cell positioned downstream from the isolation valve and selectively isolated from exposure to chamber exhaust by the isolation valve.

Moran teach an analysis chamber 422 (*endpoint detection cell*) arranged in an exhaust line 405 of a processing chamber 402 wherein the analysis chamber 422 (*endpoint detection cell*) is isolated form the exhaust line by a valve 426 for sampling process byproducts. The analysis chamber 422 (*endpoint detection cell*) comprising an excitation source 429 such as a cathode 131B and an anode 131A (Fig. 1) and an optical analyzer 438, wherein the valve 426, the excitation source 429 and the optical analyzer 438 are in communication with a system controller (column 5, line 55 through column 6, line 12 and column 3, lines 43-62). Moran teaches that the sampling of the by products begins after the process is started and the analysis of the by products is done even at a later stage (See program listing Fig 3-306 and 310)

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the endpoint detection mechanism as taught by Moran in the apparatus of Nonaka in order to sample the processing byproducts for analysis and thus separate the excitation required for analysis from fabrication process in the processing chamber, thereby reducing unwanted signals and improving the signal to noise ratio for the signals being analyzed (column 6, lines 29-36).

Furthermore : Moran further teaches that the analysis chamber 422 (*endpoint detection cell*) comprising an excitation source 429 such as a cathode 131B and an anode 131A (Fig. 1) and an optical analyzer 438, wherein the valve 426, the excitation source 429 and the optical

analyzer 438 are in communication with a system controller (column 5, line 55 through column 6, line 12 and column 3, lines 43-62).

Furthermore: the apparatus of Nonaka or Moran can be used as plasma enhanced chemical vapor deposition processing (column 2, lines 50-56-60 of Moran).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nonaka (JP 5-326457-A) in view of Moran (US Patent No. 5,986,747) as applied to claims 6 as above, and further in view of Williams et al (US Patent No. 5,472,561).

Nonaka in view of Moran teach all limitations of the claim as discussed above except for the endpoint detection cell including an RF power detector detecting an RF power of a plasma generated in the endpoint detection cell.

Williams et al teaches a plasma reactor 14 (Fig. 1) including a sensor 13 for monitoring voltage, current and phase angle of an RF signal coupled to the plasma reactor in order to control the plasma condition (abstract and column 3, lines 1-45).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the RF power detection mechanism as taught by Williams et al in the apparatus of Nonaka in view of Moran in order to monitor and control the condition of plasma in the detection cell.

Response to Amendment

Applicant's arguments filed 12/20/2004 have been fully considered. They are persuasive to enable removing rejections on the basis of Sivaramakrishnan et al.

However applicant's arguments in regards to Moran are not persuasive. Applicant argues that Moran does not disclose the selective exposure of detection cell to exhaust in a later stage of semiconductor fabrication process.

This is not correct since Moran clearly discloses that the sampling starts after several steps in the fabrication process are done like insert substrate and begin processing (Fig 3).

Moreover Moran suggests that the detection part is isolated from the fabrication process by the valve and residence time (Col 6 line 26) and discharge power can be adjusted to optimize the OES signal independent of the process. This also suggests that user could optimize when to start detection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RK

P. Hassanzadeh
SPE, AU 1763